

REMARKS

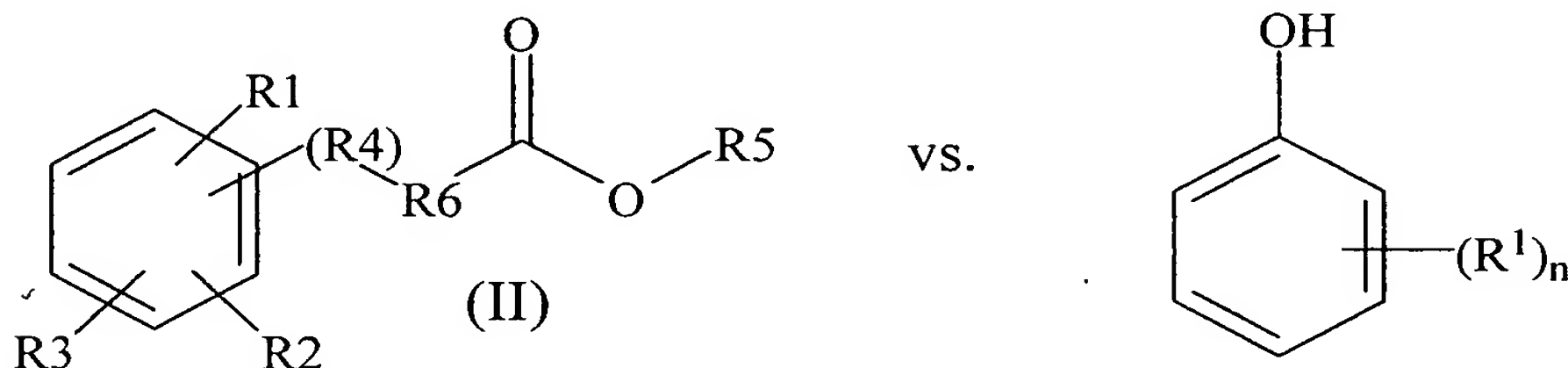
This paper is filed in response to the office action mailed on December 14, 2004. In the office action, claims 1-18 are variously rejected under 35 U.S.C. §§ 112, 102, and 103. Claims 13-18 have been canceled by this amendment. Therefore, claims 1-12 are pending in the application.

Claim 1 stands rejected under 35 U.S.C. § 112, second paragraph, for failing to distinctly claim the subject matter of the invention. The Patent Office points out that R_3 has not been defined and that R_2 is redundant. Claim 1 has been amended to correct an obvious typographical error; one of the references to R_2 has been deleted and a reference to R_3 has been added. Claim 2 has also been amended to correct an obvious typographical error. In view of these amendments to claim 1, the Section 112 rejection can be withdrawn.

Claims 1 and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,418,138 ("Curtis"). Applicants respectfully submit that this rejection is improper because Curtis fails to teach every element of claim 1.

Curtis teaches the formation of thioxanthenes starting from substituted phenols (see column 3, lines 36-47). A feature of every example taught in Curtis is that the phenol is unprotected (*i.e.* that there be a free hydroxyl group attached to the aromatic benzene ring - see the structure on the right, below). In a further *additional* step, Curtis appends functionality onto the free hydroxyl of the formed thioxanthone (see column 8, lines 39-57).

In contrast, the current application requires that the starting material be a *phenoxy* derivative (see page 3, formula (II); claim 1, formula (II); and below left). Thus, the starting material of the claimed process requires the use of a compound wherein the hydroxyl group of an optionally substituted phenol is already functionalized.



No such starting material is suggested or taught in Curtis.

A key feature of the process of the applicants' claimed process is the formation of the derivatized thioxanthenes in one step. Curtis requires at least two steps, and employs different starting materials for the condensation reaction.

A distinct advantage of any commercial chemical process is that it involve as few steps and/or intermediates as possible and have as high a yield as possible. Curtis is silent on the yields obtained, but it is clear that the process taught in Curtis is more than one step. Furthermore, the Curtis phenol starting materials are more expensive, more toxic, and more corrosive than the formula (II) derivatives claimed in the current application.

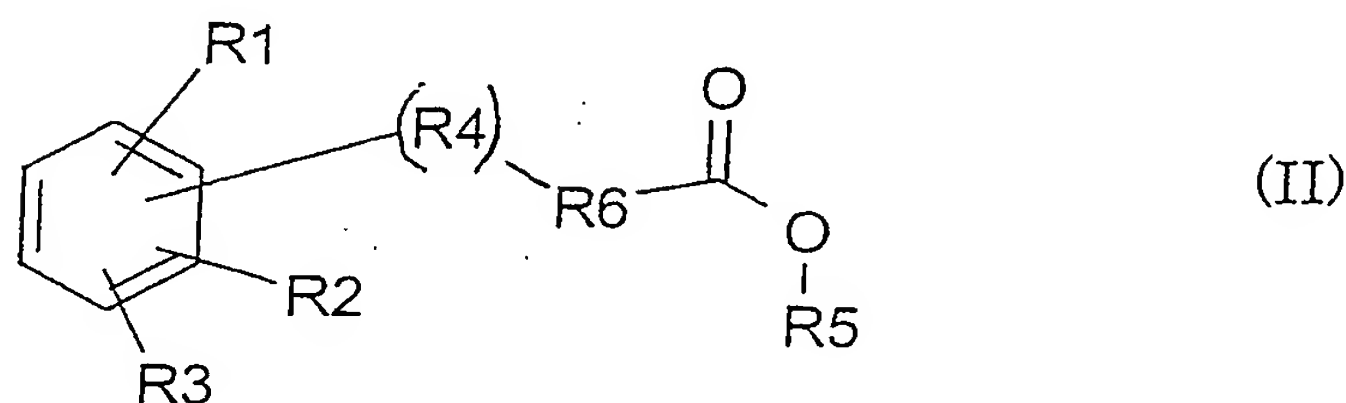
Cost is another advantage inherent in the applicants' process. Even if the steps of producing the compounds of formula (II) from phenol were included in the claimed process, the process taught in Curtis uses the most expensive raw material (the dithiobisbenzoic acid) for the first in a number of steps. It is much more cost effective to put the most expensive raw material in the latest possible stage in order to minimize waste of expensive materials. Waste of the expensive dithiobisbenzoic acid is minimized in the process of the present invention as there is only a single step.

Thus the process of the present invention provides advantages which are not present in the Curtis reaction scheme. Given these advantages, it is submitted that the anticipation rejection should be withdrawn.

Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Curtis in view of U.S. Patent No. 4,450,279 ("Shirosaki"). Applicants respectfully submit that this rejection is improper because no combination of Curtis and Shirosaki establishes a *prima facie* case of obviousness of independent claim 1.

Under MPEP §§ 2142 and 2143, to establish a case of obviousness, three criteria must be met. First, there must be a suggestion or motivation in the references cited or in the general knowledge of the art to modify the references or combine the teachings of the references. Second, there must be a reasonable expectation for success (i.e., that the proposed modification or combination would work). Third, the proposed combination of references must teach or suggest all of the claim limitations. Applicants respectfully submit that the proposed combination of Curtis and Shirosaki fails to teach or suggest every limitation of claim 1, therefore, the proposed combination fails to establish a *prima facie* case of obviousness.

Claim 1 recites a process for the formation of a thioxanthone derivative that includes reacting mercaptobenzoic acid or dithiobisbenzoic acid in the presence of sulfuric acid with a compound of formula (II):



Nowhere in either Curtis or Shirosaki is there use of a derivatized structure as represented above. Shirosaki discloses the condensation reaction employing either mercaptobenzoic acid or dithiobisbenzoic acid with benzene that has been substituted with various alkyl groups. Nowhere in Shirosaki is there mention or suggestion of the use of starting materials of formula (II) for the condensation with mercaptobenzoic acid or dithiobisbenzoic acid.

Furthermore, as stated on at the bottom of page 1 and top of page 2 of the application, conventional processes for the production of compounds of formula (I) include at least 2, if not 3 steps, leading to an overall yield of around 40% of beginning materials. The process of the current application is an improved, more efficient means of producing the desired compounds of formula (I) as it minimizes the steps in the synthesis, and uses the expensive dithiobisbenzoic acid at the latest possible step.

Thus, the combination of Curtis with Shirosaki does not teach all of the elements of the current invention, namely a process for reacting mercaptobenzoic acid or dithiobisbenzoic acid with a compound of formula (II) in the presence of sulfuric acid. Curtis shows the condensation of mercaptobenzoic acid with phenol derivatives in the presence of sulfuric acid. The Curtis condensation product is then derivatized to a compound that the current application forms in one step. Shirosaki teaches the condensation of mercaptobenzoic acid or dithiobisbenzoic acid with alkyl-substituted benzenes. It is submitted that this obviousness rejection should properly be withdrawn.

In the absence of more pertinent prior art, withdrawal of the rejections and allowance of all pending claims are respectfully requested.

Application No.: 10/613,303

Docket No.: 30538/38451

Should the examiner wish to discuss the foregoing, or any matter of form or procedure in an effort to advance this application to allowance, the examiner is urged to telephone the undersigned attorney at the indicated number.

March 10, 2005

Respectfully submitted,

By CEM.

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